## EXECUTIVE SUMMARY

Blockchain technology firms and manufacturers are developing hybrid ledger systems to track the provenance, event history, and data security of devices. The purpose of the systems include authenticity, life cycle tracking, and the safe-keeping of customer data.

Related technology manufacturing projects include computer equipment, network storage devices, and aviation.

Additionally, global healthcare technology companies, including protective equipment suppliers, are increasingly challenged with rapid response manufacturing and delivery into increasing complex national and international customer channels. '797 systems and storage help to track distribution and maintain customer safety.

ILLUSTRATIVE APPLICATION
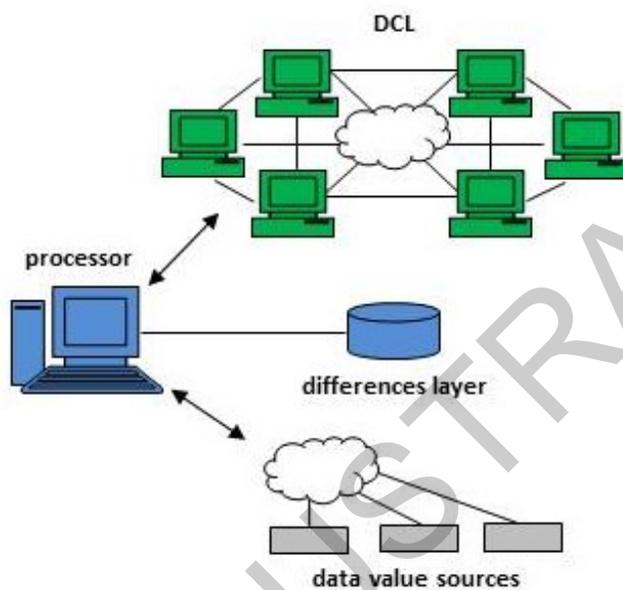
basic system components include:
> (i) a distributed computer ledger (DCL),
> (ii) a centralized or decentralized differences layer (DL),
> (iii) data values (DV) and data value sources (DVS), and
> (iv) a processor which executes inter-component operations

the figure illustrates a basic system where:

(1) manufacturing, customer, installation, service data, and differentiating descriptors are inputs (DVS) to a differences layer (DL) operated by a processor,

(2) the processor creates records on a DCL, which are aligned with the DL, where the DCL "on-chain" records are an immutable set of records accessible by third parties,

(3) in some implementations, third-parties can selectively write to the DCL, and

(4) the processor re-writes to the DCL relating to events including returns, repairs, and the safe-keeping of customer data.

'797 UNIQUE BENEFITS

'797's technology enables products and systems where transactions and transaction records are maintained on a blockchain or alternative distributed ledger, but where the processing and storage of descriptive and/or numerical values are maintained "off-chain". Traditional "smart contract" arrangements are built around "on chain" operations and "on-chain" external data calls which raise problematic storage, efficiency, and security concerns. '797 separates elements of processing and storage between "off-chain" and "on-chain" components for improved security, data integrity, and improved computer processing efficiency.

ELECTRONIC & MEDICAL INDUSTRIES CURRENT AND PROJECTED SIZES

Boston Consulting Group (BCG) estimates that fake parts in the electronic industry cost component manufacturers approximately $100 billion annually.[4] Industry sources project that the next-generation data storage market (alone) will be worth $118 billion by 2025, and BCG estimates that the financial benefits for controlling fraudulent materials in the electronics industry ranges from 4% to 7% of revenues.[4, 5]

In medical technology, BCG estimates that between $75 and $200 billion in counterfeit drugs are sold annually, and that better tracking can protect brands and increase profitability by more than 3% for healthcare and pharma entities.[4]

4. 1. "Stamping Out Counterfeit Goods with Blockchain and Iot", Boston Consulting Group, 17 May 2019

5. "Next-generation Data Storage Market Worth $118.22 Billion by 2025", Grand View Research, Inc press release, 20 Aug. 2019